Future of Tobacco Production

Health considerations aside, the case is weak for promoting long-term, worldwide increased tobacco production for economic reasons. Although tobacco is often a very profitable crop, much of its advantage stems from the various subsidies, tariffs, and supply restrictions that support its high price and provide economic rents for its producers. If the U.S. tobacco price-support program, which is an important determinant of the price of tobacco in international markets, were abolished or radically altered, foreign tobacco producers might have to contend with a massive increase in the supply of U.S. tobacco and a fall in tobacco prices that would make tobacco production much less profitable.

Other changes in the world tobacco market may also make tobacco a much less attractive crop. At present, despite substantial growth in tobacco consumption in China, which has a self-sustaining market, worldwide per capita consumption of tobacco is projected to be similar in the year 2000 to that in 1974 to 1976 (FAO 1990). Demand for tobacco in the major, developed countries has been decreasing because of health concerns. Therefore, even without a major shift in U.S. tobacco policy, tobacco-exporting countries may find it increasingly difficult to market their crop to their traditional markets in economically developed countries. In closed markets or in developing countries, this difficulty may put pressure on prices and cause countries to look for domestic outlets for their tobacco crops.

The economic implications of shifts in international tobacco markets could be significant. When producers are concentrated in the less-developed countries, as they now are (except for the United States), and their customers are concentrated in the developed world (primarily Europe and Japan), the income transfer may benefit the developing countries. If developing countries begin trading tobacco among themselves, the transfers would benefit the recipients at the expense of other developing countries, and no net gain would result for less-developed countries as a group. This intercountry transfer would be similar to that which results when high tariffs and import restrictions benefit domestic producers at the expense of domestic consumers.

The U.S. tobacco industry recently opened markets for U.S.-manufactured cigarettes in Japan, South Korea, and Taiwan (Council on Scientific Affairs 1990). Previously, sales of U.S.-manufactured cigarettes and, to a lesser extent, U.S. tobacco were restricted by these countries to protect their domestic industries. The Canadian tobacco industry is also looking for foreign markets in which to develop or expand to compensate for the decline in the Canadian cigarette market (Ontario Flue-Cured Tobacco Growers' Marketing Board 1990). In China, if domestic demand slackens, domestic health concerns increase, or the desire to earn foreign exchange develops, Chinese tobacco producers may enter the international market and have a significant impact on supply, exert downward pressure on tobacco prices, and reduce returns for other countries.

Regardless of future tobacco policies in the United States and China, a significant, excess supply of tobacco is possible. Many policies have been instituted to constrain the supply of tobacco and support current prices. Increased demand for excess tobacco is likely to come from developing countries, but demand will depend on rates of growth in income and on government tobacco policies.

Tobacco Taxation

Almost all countries levy taxes directly on tobacco products, mostly on manufactured cigarettes and imported tobacco. In some countries, the right to manufacture, distribute, and import tobacco products is reserved for a government monopoly. In such countries, the excess profits of the monopoly are a form of indirect taxation on tobacco, in addition to the taxes nominally levied.

Taxes may be extracted during most stages of tobacco processing. Import tariffs and customs duties are frequently levied on both raw tobacco and manufactured tobacco products. In many countries, some brands of manufactured cigarettes are made from tobacco blends, which include imported tobaccos. As a result, an import duty is usually included in the price of these cigarettes. In addition, imported cigarettes, usually American or European brands, are available in many countries. Because of high tariffs, these imported cigarettes sell at a substantial premium—when compared with domestically produced cigarettes, including domestically produced versions of international brands licensed by the large multinational tobacco companies. In addition to import duties, many countries levy excise taxes on domestically produced tobacco products and levy value-added, general sales, and general business income taxes.

Tobacco taxes are popular primarily because of their low administrative cost relative to generated revenues. Tobacco taxes are easy to collect because most tobacco passes through only a few physical locations (cigarette factories and/or ports of entry) during manufacturing. In countries where tobacco production and distribution are government controlled, the

government may set the margins received by retailers, as well as the prices paid to the various factors of production. Because these prices are frequently set administratively, rather than by the market, judging the net profitability of the government tobacco monopoly or determining the extent of the subsidies paid to the various production factors is difficult.

While in some countries tobacco taxes account for a substantial amount of all central government tax revenues (Chapter 6, Table 2), in the United States and Canada, these taxes account for only about 2 percent. In 1985, income tax collections accounted for less than 1 percent of GDP in Argentina (Dornbusch and De Pablo 1990) but almost 10 percent in both the United States and Canada (The World Bank 1987). In Argentina, a country of more than 30 million residents, only 1.5 million residents were registered taxpayers, and only 29,000 persons actually paid any tax. Tobacco taxes accounted for 4 percent of GDP in Argentina in 1985 (Achutti, personal communication 1990).

Recently, taxes of all kinds have not been an important source of finance for government operations in some Latin American countries. In these countries, government operations are largely financed by printing money, which results in inflation. Then, the relative importance of tobacco taxes in public finance is reduced, and if tax rates are not adjusted to an increase in the cost of living, the real value of tobacco taxes and retail prices may fall substantially.

Tobacco taxes and tariffs may be either unit or ad valorem taxes. Unit taxes are denominated at a specific nominal rate per unit of a good (per cigarette, per pack of 20 cigarettes, per kilogram of tobacco) and are most susceptible to erosion in real terms as prices increase. Even in countries such as the United States and Canada, which have had a moderate rate of inflation, unit tobacco taxes may decline over time if the nominal tax rate is not increased enough to keep pace with increases in the overall price level (Lewit 1988; USDHHS 1989). To compensate for this tendency, the Canadian cigarette tax was indexed in the early 1980s to changes in the general price level. The Canadian national tax is no longer indexed, but it has been increased more rapidly than inflation in recent years. In many countries, tobacco tariffs are ad valorem levies, which are denominated as a percentage of price (e.g., a general sales tax). Ad valorem taxes tend to track with inflation since the tax rises as the cost of cigarettes increases. Although changes in the price of imported tobacco may be captured by this mechanism, little impact on cigarette prices may result because imported tobacco and tobacco products are a small part of the tobacco market in most countries of the Americas.

Subnational Taxes

Local and provincial governments may also tax tobacco products. In the United States, all states, the District of Columbia, and many municipalities levy taxes on tobacco products, and many also tax tobacco products via general sales taxes. In recent years, the amount of tobacco tax collected by all states combined has been almost equal to that collected by the federal government. In Canada, all provincial governments also levy taxes on tobacco products, and these taxes accounted for more than 50 percent of all tobacco taxes collected in Canada in 1989 (Canadian Council on Smoking and Health 1989). In Colombia, approximately 10 percent of the revenue of provincial governments is derived from levies on Colombian cigarette sales (Nares 1984).

Differences in cigarette tax rates among countries and subnational divisions can complicate the enforcement of tax laws. In particular, big differences in tax rates provide an incentive for smuggling—the purchasing of cigarettes in low-tax jurisdictions for consumption or resale in high-tax jurisdictions. Various tax-evasion activities have been identified: buying cigarettes in neighboring lower-tax areas for personal consumption; organized smuggling of cigarettes for commercial resale; purchasing cigarettes through tax-free outlets (international ports of entry, military stores, and Indian reservations); and illegal diversion of cigarettes within the traditional distribution system (forged tax stamps and underreporting) (Advisory Commission on Intergovernmental Relations 1977).

In the United States, as the differentials in state tax rates increased rapidly during the late 1960s and early 1970s, the level of cigarette tax evasion also increased substantially. In response, the Federal Cigarette Contraband Act was enacted. Law enforcement problems, stemming from organized interstate cigarette smuggling, contributed to the deceleration of state tax increases in high-tax states (Advisory Commission on Intergovernmental Relations 1985). Because the range of real prices has declined among states, interstate smuggling has become less profitable. This decline in profitability and increased federal enforcement have probably accounted for the subsequent decline in cigarette smuggling (Advisory Commission on Intergovernmental Relations 1985).

International cigarette smuggling can have an adverse impact on national tobacco companies and reduce revenue for governments. In Colombia, where

cigarettes are subject to indirect taxation of up to 120 percent of the wholesale price, contraband U.S. cigarettes have been smuggled into the country from the United States, Panama, Venezuela, and the Caribbean (Nares 1989; *Tobacco International* 1989). The president of Coltabaco (Cia. Colombiana de Tabaco S.A.), the Colombian tobacco company, estimates that smugglers now control 35 percent of the national cigarette market (Nares 1989). In Canada, citizens cross the U.S.-Canadian border to purchase Canadian cigarettes in U.S. duty-free shops. The increase in this activity may be linked to recent substantial increases in Canadian cigarette taxes (USDA 1990).

Effects of Excise Taxes on Smoking

One nearly universal economic concept is the law of downward-sloping demand—that is, the quantity of a commodity demanded declines as the price for that commodity increases. Numerous econometric studies have confirmed that this law holds for cigarettes, even though they are addictive, and the relation has also been demonstrated for various addictive drugs (Henningfield 1986). Because excise taxes increase the price of cigarettes, such increases should reduce the demand for cigarettes.

An analysis of the price elasticity of demand for cigarettes estimates the effect on consumption of a change in excise tax rates. Price elasticity of demand measures the degree of responsiveness of demand to changes in price; it is the percent change in the quantity of a good demanded, divided by the percent change in price that caused the demand change. Thus, an elasticity of -0.5 means that a 10 percent increase (decrease) in price would reduce (increase) by 5 percent the quantity of cigarettes demanded. To determine the effect of a tax change, the price elasticity of demand must be multiplied by the percent change in price that resulted from a tax change, since cigarette taxes account for only a part of the total retail price of cigarettes. The elasticity of demand with respect to a tax change is generally less than the price elasticity of demand.

Numerous attempts have been made to measure the price elasticity of demand for cigarettes (Table 11). The estimates are from econometric studies that attempt to explain differences in cigarette consumption as a function of price, income, and demographic variables. Different data sets, units of observation, and statistical techniques were used. Estimates were derived from (1) time series of per capita cigarette consumption for countries as a whole or for cross sections of states or countries and (2) survey data on the smoking behavior of cross sections of populations at a point in time and over time. Each of these procedures may result in problems of interpretation. In the time-series studies, the estimates of both price and income elasticity are sensitive to the construction of the different models. In addition, time-series estimates are frequently unstable because the independent variables tend to be highly correlated with each other. On the other hand, estimates based on cross sections of tax-paid sales may be biased upward because some cigarettes sold in low-tax areas are consumed by smokers in high-tax areas. As a result, the estimated price elasticity of sales exceeds the price elasticity of actual consumption.

Data for participants in two national U.S. surveys were used to evaluate the effects of price (tax) differences on individual smoking behavior (Lewit, Coate, Grossman 1981; Lewit and Coate 1982). For a sample of 19,288 persons aged 20 to 70 from the 1976 National Health Interview Survey, the overall price elasticity was estimated at -0.42 for cigarettes (Lewit and Coate 1982). A more detailed breakdown suggested that increased prices primarily reduced the number of smokers (measured as prevalence, or the participation rate) (Lewit and Coate 1982). The estimated effects on the number of cigarettes consumed per smoker were not statistically significant. Differences in the estimated price elasticity were also found among groups; reported elasticity was much higher for adult males than for adult females and much higher for persons aged 20 to 25 than for those in other age groups (Table 12).

In a methodologically similar study, smoking was analyzed for a national sample of 6,788 youths, aged 12 to 17, surveyed between March 1966 and March 1970 (Lewit, Coate, Grossman 1981). Because antismoking messages were broadcast during this period (under the Federal Communications Commission's Fairness Doctrine), these researchers were also able to investigate the effect of that policy on teenage smoking. They reported that elasticity of demand for cigarettes was greater in absolute value for teenagers than for adults (Table 12). In addition, smoking participation was more responsive to price than was quantity smoked. The estimated teenage smoking participation elasticity was -1.20, and the elasticity for quantity smoked, conditional on smoking, was -0.25.

These results suggest that increases in tobacco taxes can deter smoking. Since teenagers appear to be more responsive than adults to changes in the price of cigarettes, excise tax increases may be very effective in preventing the onset of smoking by teenagers. By preventing the onset of this addictive behavior,

Table 11. Recent estimates of the price elasticity of demand for cigarettes

Reference	Estimated aggregate price elasticity	Data, country, dates
Walsh (1980)*	-0.79, -0.38†	Ireland, 1953–1976
Lewit, Coate, Grossman (1981)	-1.44	HES III‡ 12- to 19-year olds United States, 1966–1970
Lewit and Coate (1982)	-0.42	NHIS§ Elasticities by age and sex 20- to 74-year olds United States ,1976
Peturinen (1984)*	-0.48‖ -0.96	Finland, 1960–1981 Tested, 1982–1983
Advisory Commission on Intergovernmental Relations (1985)	-0.45	Pooled time series of state cross sections United States, 1981–1983
Bishop and Yoo (1985)	-0.45	Time-series aggregate data United States, 1954–1980
Mullahy (1985)	-0.47	NHIS§ by sex United States, 1979
Radfar (1985)*	ST¶-0.23 LT -0.39	United Kingdom, 1965–1980 (quarterly)
Collishaw, Myers, Rogers (1985)	ST -0.42 LT -0.91	Canada, 1950–1982
Porter (1986)	-0.27	Time-series aggregate data United States, 1947–1982
Worgotter and Kunze (1986)*	-0.54	Austria, 1955–1983
Becker, Grossman, Murphy (1990)	LT -0.75	Pooled time series of state cross sections United States, 1956–1985
Chaloupka (1990)	-0.26	NHANES II** Full sample; also by age, sex, race, and education United States, 1976–1980
Townsend (1990)	-0.40	Europe, 1987–1988
Jacobson and Rodway (1990)	LT -0.6 to -0.8	Canada, 1973–1988

*Studies mentioned in Townsend (1990).
†The first estimate is pre-1961, and the second post-1961.
‡U.S. Health Examination Survey, Cycle III.
§National Health Interview Survey.
‖The first estimate is for a price increase, and the second for a decrease.
¶ST = Short term; LT = Long term.
**National Health and Nutrition Examination Survey.

Table 12. Estimates of the price elasticity of demand for cigarettes in the United States,* by age group

Age group (years)	Elasticity		
	Total	Participation	Quantity†
12–17	-1.40	-1.20	-0.25
20–25	-0.89	-0.74	-0.20
26–35	-0.47	-0.44	-0.04
36–74	-0.45	-0.15	-0.15
All adults (20–74)	-0.42	-0.26	-0.10
All ages (12–74)	-0.47	-0.31	-0.11

Source: Lewit and Coate (1982); Lewit, Coate, Grossman (1981); Lewit (1985).
*Calculated from source data.
†Elasticity for quantity smoked for persons who smoke.

prevalence of smoking and its associated detrimental health effects would decline gradually but substantially over several decades—rather than in the years immediately after a tax increase. In addition, since price elasticity affects prevalence of smoking far more than quantity smoked, attempts by smokers to compensate for fewer cigarettes (by inhaling more deeply and frequently, reducing idle burn and butt length, or even switching to higher tar and nicotine brands) appear to be relatively infrequent responses to price increases.

Formal estimates of the price elasticity of demand for cigarettes in Latin America and the Caribbean are not readily available, and few data have been gathered for other developing countries (Chapman and Richardson 1990). In many developing countries, the price elasticity of demand for all tobacco products may be difficult to measure and may be much lower than that for cigarettes. In response to a tax increase on cigarettes, smokers may substitute lower-priced tobacco products. In many Latin American and Caribbean countries, the price of cigarettes varies widely by brand, and smokers may respond to a tax (price) increase by switching to a lower-priced brand. This recently occurred in the Philippines; when cigarette taxes were increased more on high-priced than on low-priced brands, consumers switched to low-priced brands. Total cigarette tax collections declined even though the tax rate had been increased on all brands (Singh 1988a,b,c,d). Marginal consumers may respond to a tax increase by switching to "roll-your-own" or homemade cigarettes. In addition, as noted above, high taxes and tariffs encourage smuggling, which may provide cigarettes at less-than-fully taxed prices.

Modeling Addiction

Although the addictive nature of cigarette consumption has been recognized for some time (USDHHS 1988), most economic studies of the demand for cigarettes have not explicitly allowed for addiction. The consumption of addictive goods in general was not believed to conform to the rational, utility-maximizing model that is the paradigm of standard economic analysis. Recently however, Becker and Murphy (1988), among others, have developed models of rational addiction that distinguish between the consumption of addictive and nonaddictive goods and that allow for economic analysis. The Becker-Murphy models recognize that current consumption of addictive goods depends on the level of past and future consumption. The model accounts for tolerance, reinforcement, and withdrawal—factors that distinguish between use of addictive and nonaddictive substances (USDHHS 1988). With regard to the price elasticity of demand for cigarettes, the Becker-Murphy approach implies that lower past prices and lower future prices lead to greater current consumption and that the long-term response will exceed the short-term response to a permanent price change.

To test the rational addiction model, Becker and colleagues (1990) used a time series of cross-sectional samples of U.S. per capita state tax-paid cigarette sales, by state, for 1956 to 1985. The results demonstrated a linkage across time periods between price and cigarette demand. In particular, the authors found that a 10 percent permanent increase in the price of cigarettes would reduce current consumption by 5 percent initially and by 7.5 percent over the long term.

Using data for participants aged 18 to 74 in the second National Health and Nutrition Examination Survey, Chaloupka (1990) tested several implications of the rational addiction model. The resultant estimates of the price elasticity of demand were less than those reported by Becker and colleagues (1990) and by Lewit and Coate (1982); the latter analysis did not explicitly allow for the addictive component in cigarette demand.

The application of the rational addiction model to cigarette consumption is a recent development; further investigation and refinement are required before the contribution of the model to the understanding of

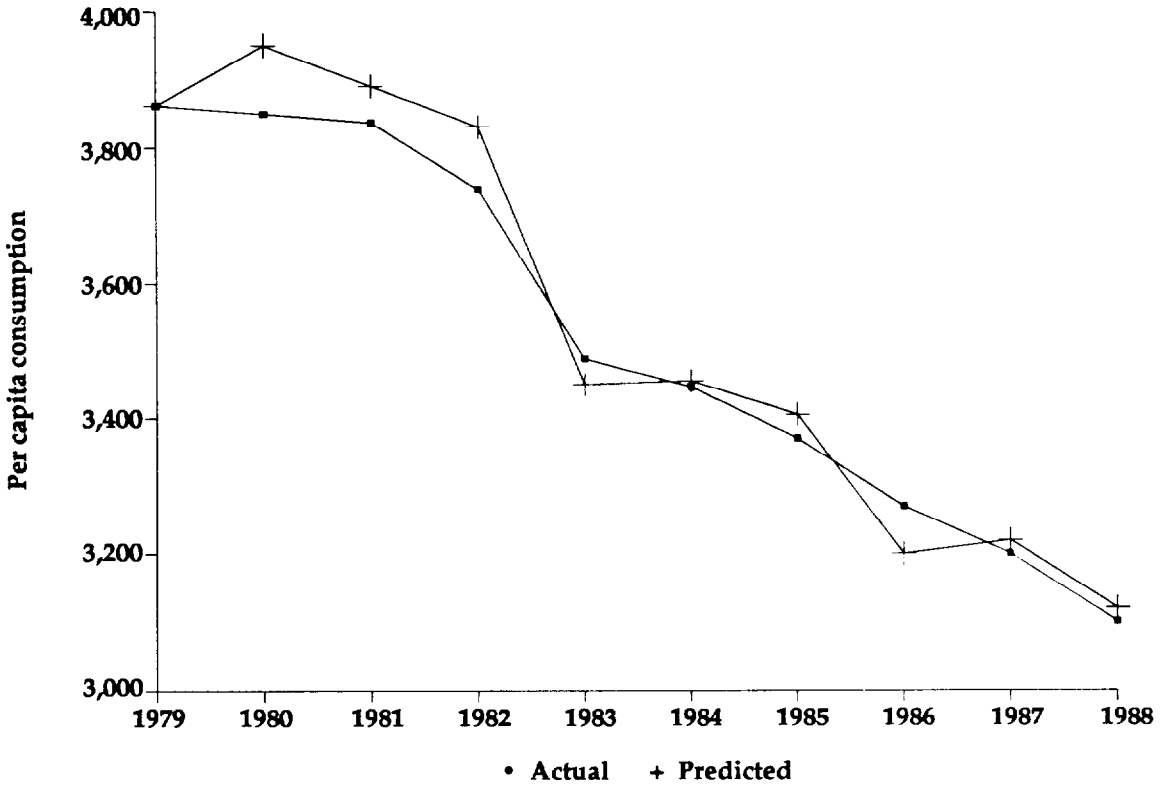
smoking behavior can be fully evaluated. The range of estimates of the long-term price elasticity of cigarette demand derived from the model are not inconsistent with previously published estimates; thus, analyses of the effect of doubling the U.S. cigarette tax in 1983 (discussed next) are not likely to be invalidated by further refinement of the model.

Analysis of Recent Tax Increases

After the federal excise tax on cigarettes was doubled in 1983, total U.S. cigarette consumption declined (Lewit 1988). Before 1982, retail cigarette prices had been increasing more slowly than the general rate of inflation, and as a result, the real price of cigarettes was declining. In anticipation of the January 1, 1983, tax increase, U.S. tobacco companies increased the wholesale price of cigarettes at regular intervals beginning in August 1982 (see also Chapter 2, "The Emergence of the Tobacco Companies"). From 1983 to 1991, the federal excise tax did not increase, but retail cigarette prices continued to increase more rapidly than the general rate of inflation—because of an aggressive pricing policy of the tobacco companies and increases in taxes in many states. Between 1981 and 1988, the price of cigarettes, adjusted for inflation, rose by 57 percent. Based on a price elasticity of -0.42, per capita consumption should have declined by about 23 percent over this period (Figure 5). Data from USDA indicate a decline of about 20 percent. U.S. per capita cigarette consumption had been declining slowly—about 1 percent per annum since the mid-1970s. The very rapid acceleration in the rate of decline—to about 3 percent annually after the excise tax and associated price increases—is consistent with Lewit and Coate's (1982) estimates and serves as further evidence that excise taxes may be a potent tool for reducing cigarette consumption.

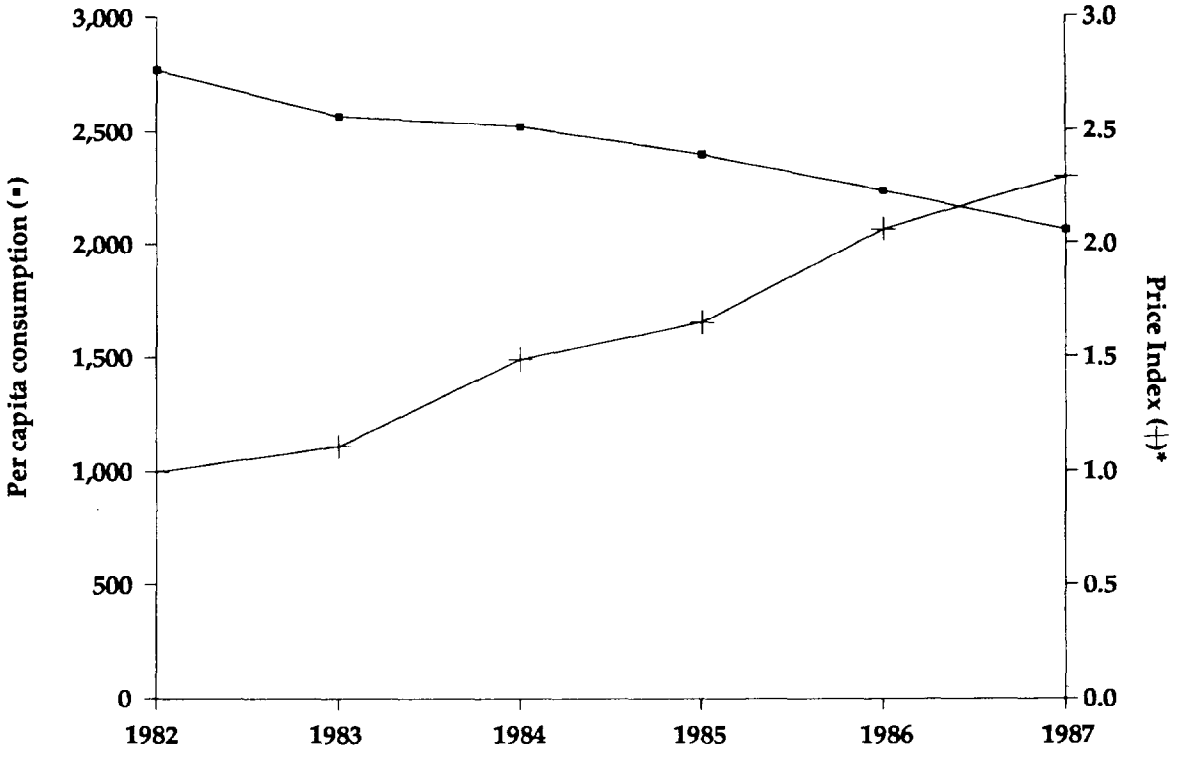
The Omnibus Budget Reconciliation Act of 1990 provides for two increases in U.S. federal excise taxes on cigarettes and other tobacco products (USDA 1990).

Figure 5. Predicted and actual per capita (≥18 years of age) consumption of cigarettes, United States, 1979–1988*



Source: Grise and Griffin (1988); U.S. Department of Agriculture (1991).
*Actual values from source; predicted values calculated by Lewit (unpublished data). Predicted values are based on a price elasticity of –0.42.

Figure 6. Per capita consumption and real price of cigarettes in Canada, 1982–1987



Source: ERC Statistics International Limited (1988).
*Relative cost per pack of cigarettes (1981 = 1.0).

The cigarette tax was increased four cents per pack beginning January 1, 1991, and will increase an additional four cents on January 1, 1993. The tax on snuff increased from 24 cents per pound to 30 cents per pound in 1991 and will increase to 36 cents in 1993. Chewing tobacco tax will increase by eight cents per pound (to ten cents) in 1991 and by 12 cents in 1993. Taxes on other tobacco products were also increased. Although it is still too early to judge the effect of these taxes on tobacco consumption, the impact may not be the same as that from the 1983 tax increase because of the substantial increase in retail tobacco prices since 1982 (also discussed in Chapter 2, "The Emergence of the Tobacco Companies"). The current tax increases will result in a smaller percent increase in retail prices than did the percent increase that accompanied the 1983 tax rise.

In Canada, in part due to a very aggressive antismoking campaign, both federal and provincial cigarette excise taxes have increased substantially since 1980 (Figure 6). The federal tax rose by 179 percent between 1980 and 1988, and provincial taxes rose by an average of 367 percent during the same period. Overall, the real price of a pack of cigarettes almost doubled between 1982 and 1987, and per capita consumption fell by more than 30 percent during the same period.

In Latin America, evidence of the impact of cigarette tax increases on consumption is found in Brazil, where after years of rapid growth, per capita cigarette consumption fell substantially in the early 1980s in response to a large cigarette tax increase and a general economic slowdown (USDA 1985). In developing countries, income may play an important role in determining smoking behavior. A decline in per capita cigarette consumption in Peru and Bolivia in the 1980s has been attributed to falling incomes in both countries (Chandler 1986).

Health Consequences of Tax Changes

In some countries, a policy of aggressively increasing cigarette taxes could lead to a large reduction in smoking-related illness and an improvement in the general level of health. The information on price and

income elasticity given here can be used to make rough estimates of the health effects of changes in tobacco taxation in the United States and Canada.

Both Warner (1986) and Harris (1987) have provided crude estimates of some of the health effects that might result from the 1983 U.S. federal tax increase. Based on the conservative assumption that one of every four lifelong smokers dies of smoking-related illness (Mattson, Pollack, Cullen 1987), Warner calculated upper-bound estimates of the impact on mortality of increases or decreases in federal excise tax. Warner estimated that an eight-cent tax increase, maintained in real value over time, would avert 450,000 premature deaths among Americans aged 12 or older in 1984 and that this number would rise to 860,000 after a 16-cent increase.

Harris estimated that as a result of the post-1983 tax-induced price changes and their impact on consumption, 100,000 additional persons will live to age 65. About 54,000 of these persons are among the 600,000 teenagers who will live to age 65 as a result of having been discouraged from starting to smoke. Thus, for the 1983 U.S. federal tax increase, the main effect on mortality will not be realized for decades. Although no estimates have been published on the impact of the tax increase on other health measures, reductions in smoking-related morbidity and disability should raise aggregate health levels long before the projected reduction in mortality is fully realized.

For other countries in the Americas, elasticity estimates from the United States and Canada may be misleading, and country-specific estimates are needed. More precise estimates depend on additional information about the number of persons who smoke less, stop smoking, or do not start to smoke as a result of tax changes. But the declining economy in Latin America and the Caribbean and the attendant decline in tobacco consumption suggest that excise taxes could have a substantial impact on long-term morbidity and mortality in the region. This supposition is reinforced by the latency of the health effects of tobacco use (addressed earlier) and by the fact that the tobacco epidemic is still immature in many countries of Latin America and the Caribbean (Chapter 3, "Smoking-Attributable Mortality in Latin America and the Caribbean").

Equity, Incidence, and Distribution of the Tax Burden

Tobacco excise taxes are primarily a revenue-generating device. As such, attention must be paid to the distribution of the burden of these taxes among the general population and to their impact on the economy. Tobacco taxes are mainly collected from manufacturers and distributors at the wholesale level. To the extent that these businesses can raise the retail price of cigarettes, they do not pay the tax but shift the incidence of the tax burden to consumers. In addition, the tax may lower the demand for tobacco, which would result in lower tobacco prices (Sumner and Wohlgenant 1985) and place some of the incidence of the tax burden on tobacco growers.

Because the tobacco tax is primarily paid by smokers (Sammartino 1987), the distribution of the tax burden in the general population mirrors the distribution of smokers. In the United States, as the health hazards posed by tobacco use have become more well known, tobacco consumption has decreased more rapidly in higher than in lower socioeconomic groups (USDHHS 1989). Consequently, tobacco consumption has become more concentrated in lower socioeconomic groups, and tobacco tax increases, as a share of income, would fall most heavily on these groups. Sammartino (1987) analyzed the distributional effects of a hypothetical $1 billion increase in the U.S. federal excise taxes on beer, wine, distilled spirits, tobacco, gasoline, airfares, and telephone service and concluded that an increase in the tobacco tax would be the most regressive.

In some Latin American countries, such as Brazil, Uruguay, and Venezuela, prevalence of smoking is also higher for lower socioeconomic groups (Chapter 3, "Prevalence of Smoking in Latin America and the Caribbean"). In these countries, tobacco tax increases might also be regressive. In most other countries of the Americas, however, cigarette smoking is positively correlated with income. Moreover, in most Latin American and Caribbean countries, high-income smokers are more likely than low-income smokers to consume more cigarettes and purchase expensive brands of cigarettes. When increased revenues from tobacco taxes reflect expenditures on tobacco, the taxes may be proportional relative to income even in countries in which smoking is more common among the lower socioeconomic groups. Tobacco taxation may be progressive in countries in which smoking prevalence is positively correlated with income. The actual incidence of tobacco taxes must be determined for each country, and attempts to make cigarette taxes progressive, as was recently done in the Philippines, can be thwarted if high tax rates cause smokers to substitute low-price/low-tax brands for high-tax brands (Singh 1988a,b,c,d).

Although the potential regressiveness of tobacco taxes is a valid concern, the desire for proportional or even progressive tax systems does not require that all

potentially regressive taxes be avoided. Most tax systems are a mix of many different taxes, and fairness can be achieved by increasing progressiveness elsewhere in the tax system to balance tobacco tax increases or, perhaps more importantly, by directing revenues to the maintenance of or increases in benefits for low-income groups.

Use of Tobacco Taxes

Health care costs and work-loss rates are greater for smokers than for nonsmokers. In the United States and Canada, both public and private insurance plans provide much of the financing for health care and disability benefits. Thus, increases in tobacco taxes have recently been advocated as a form of user tax (similar to the U.S. federal gasoline tax used to finance highways) or as a corrective tax to compensate for the additional health-related costs that smokers impose on others.

Several studies have attempted to measure the medical care, morbidity, and mortality costs attributable to smoking in a particular year. These estimates (described earlier in this chapter) cannot be used to establish the appropriate level of tobacco taxation because, in addition to several methodological limitations, the estimates do not explicitly distinguish between costs borne by smokers (e.g., the cost of premature death) and costs shifted to others (i.e., external costs). Moreover, these estimates do not adequately account for the social insurance benefits that nonsmokers realize but smokers do not because of their premature death associated with smoking.

Smokers tend to contribute to retirement plans at the same rate as nonsmokers do, but they do not collect, on average, the same total pension over a lifetime as nonsmokers do. Smokers' uncollected pension claims revert to nonsmokers by increasing the ratio of benefits to contributions that nonsmokers receive. In any particular country, the magnitude of the burden of smoking-related costs borne by nonsmokers is determined by the costs of the excess illness, the morbidity and mortality caused by tobacco, and the national system for financing health care, disability, and retirement in that country. The key variable is the amount of excess tobacco-related costs borne by nonsmokers relative to the rate of taxation on tobacco. In reviewing the situation in Ontario in 1978, Stoddart and colleagues (1986) found that, even with a government health care system and high-technology medical care, health care expenditures attributable to smoking amounted to a maximum of 30 percent of the tax revenue on tobacco products. They also concluded that no uncompensated externality existed in Ontario in 1978. Collishaw and Myers (1984), using a different methodology, also found that for Canada in 1979, total tobacco taxes exceeded government-financed health care costs attributable to smoking.

In the most recent and comprehensive examination of the external costs of smoking in the United States, Manning and co-workers (1989) found that cross-subsidies, implicit in the current U.S. system for financing health care, disability, and pension benefits, transfer from never smokers to smokers and from smokers to never smokers. Thus, on average, never smokers subsidize the excess nonaged health care, disability, and sick-leave benefits of smokers, and smokers subsidize the Medicare and retirement benefits (pensions and Social Security) of never smokers. Manning and associates (1989) reported that their estimates of the net external economic costs of smoking are quite sensitive to two parameters: the rate of discount and the determination of which health differences between smokers and never smokers are actually caused by, rather than merely associated with, smoking. Nonetheless, their best and high estimates of the external economic costs of smoking fell below the average excise tax (state plus federal) imposed at the time of their analysis, which suggested that, at that rate of taxation, smokers probably compensated for the costs of smoking imposed on never smokers. Since the publication of their analysis, evidence of additional hazards of passive smoking has been reported (Glantz and Parmley 1991). Such evidence suggests that the net costs that smokers impose on never smokers in the United States may have been underestimated.

No known studies from other countries in the Americas evaluate the excess financial burden imposed on never smokers by smokers. However, uncompensated financial externalities may be substantial in countries at the upper end of the income scale where life expectancy and patterns of tobacco consumption are similar to those in the United States and Canada. In the few countries at the lower end of the income scale, such uncompensated externalities may be minimal for two reasons: (1) in the absence of well-organized institutional support systems, the excess costs of smoking are unlikely to be shifted from smokers to never smokers and (2) the total cost of smoking-related illness may be low if life expectancy is short (as in Bolivia and Haiti [PAHO 1990]), if many competing causes of disease and death are operative, if smoking is a recently introduced activity, or if medical care is inexpensive.

The essence of the argument for tobacco taxes is that tobacco-related illnesses may impose an uncompensated burden on never smokers regardless of their income class. If, however, smoking is positively correlated with income, smoking-related illness is more likely to occur among persons higher in the income distribution. Hence, increases in smoking-related illnesses may result in a shift in health care resources to provide expensive hospital-based care for affluent smokers. If such a shift occurs at the expense of health programs for low-income groups, it may have an undesirable effect on the health of the disadvantaged and on the total income distribution, including transfers (Lewit 1988). As a means of addressing this particular inequity, high tobacco taxes might be justified, whether they discouraged smoking or were used to finance excess health care for smokers.

Another justification for a high tobacco tax is that, to smokers or potential smokers who lack complete information on the dangers of tobacco use, the tax may signal the total costs of tobacco use, including the costs of ill health. An increase in tobacco taxes could improve health by discouraging tobacco use among persons who would not have used tobacco if they were fully informed. The effect would be particularly beneficial if it interfered with the initiation of tobacco use—before smokers became addicted.

Conclusions

1. Because the health costs of tobacco consumption result from cumulative exposure, they are most pronounced in the economically developed countries of North America, which have had major long-term exposure. Since many countries of Latin America and the Caribbean are experiencing an epidemiologic transition, the economic impact of smoking is increasing.

2. The economic costs of smoking are a function of the economic, social, and demographic context of a given country. In the United States, estimated total lifetime excess medical care costs for smokers exceed those for nonsmokers by $501 billion—an average of over $6,000 per current or former smoker. Similar formal estimates for many Latin American and Caribbean countries are not available.

3. Evidence of the cost-effectiveness of smoking control and prevention programs has increased. In Brazil, for example, the cost of public information and personal smoking-cessation services is estimated at 0.2 to 2.0 percent of per capita GNP for each year of life gained; treatment for lung cancer costs 200 percent of per capita GNP per year of life gained.

4. In Latin America and the Caribbean, as GNP increases, cigarette consumption increases, particularly at lower income levels. This effect is attenuated at higher income levels.

5. Advertising tends to increase consumption of cigarettes, although the relationship is difficult to quantify precisely. Advertising restrictions are generally associated with declines in consumption and, hence, are an important component of tobacco-control programs.

6. The case for promoting increased tobacco production on economic grounds should be reconsidered. Although tobacco is typically a very profitable crop, much of the advantage of producing tobacco stems from the various subsidies, tariffs, and supply restrictions that support the high price of tobacco and provide economic rents for tobacco producers. Although the tobacco industry is a significant source of employment, production of alternative goods would generate similar levels of employment.

7. Increases in the price of cigarettes, which are a price-elastic commodity, cause decreases in smoking, particularly among adolescents. Excise taxes may thus be viewed as a public health measure to diminish morbidity and mortality, although the precise impact of taxes on smoking will be influenced by local economic factors.

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Chapter 5
Legislation to Control the Use of Tobacco in the Americas

Preface

Governments express their will through legislation and regulation. Historically, many public health issues have been managed by governmental rule making. Some of the major scientific advances of recent years have been translated into public health practice through the gradual development of sanitary codes, public health laws, or equivalent sets of regulations.

In recent years, the pace of enacting legislation to prevent and control tobacco use has accelerated. The current status of tobacco-control legislation in the Americas is reviewed in this chapter, and a comprehensive set of current legal citations is provided for selected countries of the Americas.

Introduction

Ninety-one countries worldwide have enacted legislation to control tobacco use (Roemer, in press). Less than one-third of these countries are in the Americas, and their laws vary in scope and rigor. Comprehensive laws, which provide a wide range of control, are rare; most laws in the Americas are categorical and deal with one or another aspect of tobacco promotion and use. Restrictive legislation has generally been enacted at the national government level, but the potential of subnational legislation is reflected in the large number of restrictive laws, ordinances, and bylaws enacted by state or provincial and local governments in Canada, in the United States, and, increasingly, in many Latin American and Caribbean countries.

Although tobacco has been in use in the Americas for centuries (see Chapter 2), public policy on tobacco control is fairly recent. The sale of tobacco to minors has long been prohibited, but more for moral rather than health reasons. For years, local ordinances have prohibited smoking in cinemas and theaters as a fire-prevention measure. But legislation focusing on control of tobacco use to prevent chronic disease began in North America only 25 years ago. Following the issuance in 1964 of the Surgeon General's landmark report (Public Health Service 1964), the U.S. Congress passed the Federal Cigarette Labeling and Advertising Act in 1965.

In 25 years of worldwide efforts to control the smoking epidemic, the key role of legislation has become clear. In 1990, the 43rd World Health Assembly reaffirmed the effectiveness of tobacco-control strategies and, in particular, legislation and policies to (1) protect against exposure to environmental tobacco smoke in workplaces, public places, and public transportation; (2) increase the real price of tobacco; and (3) control direct and indirect advertising and promotion of tobacco products (World Health Organization [WHO] 1990a,b).

Purposes of Legislation

Law is a powerful tool for closing the gap between social policy and scientific knowledge about tobacco. The purposes of such legislation are as follows:

- To set forth government policy on production, promotion, and use of tobacco, and to place the government squarely on the side of health.
- To encourage smokers to stop smoking, and to dissuade young people from starting to smoke or from using smokeless tobacco.
- To provide protection against the dangers of exposure to environmental tobacco smoke in enclosed public places.
- To monitor and control the content of manufactured tobacco products.
- To contribute to the development of a social climate in which smoking and other forms of tobacco use are unacceptable.
- To provide for the allocation of resources to support effective programs to combat smoking.
- To provide the legal basis for enforcement of a tobacco-control policy.

These purposes are widely recognized, although they may be formulated in various ways (Bechara and Jacob 1985).

Two principal types of legislation have been enacted: (1) legislation to change the production, manufacture, promotion, and sale of tobacco (supply) and (2) legislation to change smoking behavior (demand). Within each of these two broad categories, specific kinds of laws have been enacted to combat tobacco use. For example, the latter category includes nonsmokers' rights laws, which aim to protect nonsmokers from the health effects of exposure to environmental tobacco smoke.

Method of Analysis

The kinds of laws in these two categories of legislation were examined through 1990 for North America, Latin America, and eight Caribbean countries (Bahamas, Barbados, Bermuda, Grenada, Guyana, Jamaica, Saint Lucia, and Trinidad and Tobago). Special comment is made on the French overseas departments and territories in the Americas. The principal focus is on the laws of countries in Latin America and the Caribbean. Particularly noteworthy national legislation and regulation are described in Appendix 2.

Legislation to Control Production, Manufacture, Promotion, and Sales

Laws and policies in this category are directed toward controlling the tobacco industry (including growers, manufacturers, and distributors), as well as advertising agencies, the media, and tobacco retailers. However, these laws can change the social environment for a whole population and thus influence the conduct of individual persons. For example, laws banning the advertising and promotion of tobacco alter the environment in which young people grow up and help free them from pressure to smoke.

Table 1 summarizes the types of legislation (and the number of countries that have enacted each type) designed to control the production, sale, and promotion of tobacco. Several of these controls are discussed further below. Economic strategies, such as tax and price policies, are discussed in Chapter 4.

Control of Advertising

The tobacco industry's enormous expenditure on advertising and promotion—approximately $3.3 billion in the United States in 1988 (Centers for Disease Control [CDC] 1990a)—reflects the importance that the industry attaches to advertising. The role of advertising and promotion in increasing sales and consumption is difficult to quantify precisely (U.S. Department of Health and Human Services [USDHHS] 1989; Tye, Warner, Glantz 1987; Toxic Substances Board 1989; Warner 1986b) (see Chapter 4).

Advertising sends the message that smoking is acceptable and pleasurable. Moreover, the dependence of newspapers and magazines on advertising revenue from the tobacco industry may hinder the publication of information about the hazards of tobacco use (Whelan 1984; USDHHS 1989). As prevalence of smoking has declined in Canada, the United States, and other industrialized countries, transnational tobacco corporations have intensified their promotion of cigarettes in developing countries (Muller 1978; Nath 1986; Lokschin and Barros 1983; Stebbins 1987; Davis 1986). (See Chapter 2, "The Emergence of the Tobacco Companies.")

Several types of legislation control advertising and promotion of tobacco products in the Americas

Table 1. Number of countries that control the production, sale, and promotion of tobacco, by type of legislation* and region

Type of legislation	Worldwide†	North America	Latin America	Caribbean‡
Total ban on advertising	20	1	1	1
Some restrictions on advertising	38	2	15	4
Restrictions on sponsorship of sports and cultural events	NA§	1	3	
Rotating or stronger warnings	9	2	2	3
Standard warning‖	53	0	12	2
Statement of tar and nicotine yield	22	1	3	3
Restrictions on sales to adults	6	2	3	
Increased taxes and prices¶	NA	2	NA	
Revenue from taxes allocated to health purposes	NA	1	1	
Economic strategies¶	NA	1	NA	

*Includes national and subnational legislation.
†Roemer (1986).
‡Includes the French overseas departments and territories. Blank indicates that no such legislation is known to exist.
§NA = Not available.
‖A single statement of warning not rotated with other statements.
¶Tax and price policies and economic strategies are discussed in Chapter 4.

(Table 2). Except for Canada, Cuba, and the French overseas departments and territories, all countries in the Americas that have enacted legislation to control cigarette advertising have imposed moderate, partial bans.

North America

Canada was the first country in the Americas to enact a total ban on advertising and promoting tobacco. The Tobacco Products Control Act (Health and Welfare Canada 1989a) took effect on January 1, 1989; it provides, in Section 4, as follows:

> No person shall advertise any tobacco product offered for sale in Canada.

The statute and the regulations, however, provide the tobacco manufacturing, importing, and advertising industries with a period of adjustment during the transition to the new requirements and with a few limited exceptions to the ban (Kyle 1990). Per capita tobacco consumption decreased 8 percent in the year after the act took effect (Kaiserman and Allen 1990), although this decrease may have resulted from the combined effect of several factors. The law was challenged in court by Imperial Tobacco Ltd. (Montreal) and RJR-MacDonald Inc. In July 1991, the challenge was upheld; the law was declared unconstitutional but was allowed to remain in effect pending appeal (RJR-Macdonald Inc. v. Attorney General of Canada 1990; Imperial Tobacco Limited v. Attorney General of Canada 1990).

In the United States, all cigarette advertising has been prohibited on television and radio since the enactment of the Public Health Cigarette Smoking Act of 1969, which became effective in January 1971. This ban was extended to little cigars in 1973 and to smokeless tobacco in 1986. Health warnings are required in cigarette and smokeless tobacco advertisements (see next topic).

State and local legislation to control tobacco advertising has been used to a limited extent in the United States because such legislation was preempted by the federal act of 1969. Nevertheless, some cities have restricted local advertising; bans on advertisement of tobacco in transit systems and on distribution of free tobacco products have been adopted in several cities, including Boston, New York, and Atlanta (USDHHS 1989). Sports stadiums in a few large cities in the United States have voluntarily banned tobacco advertising.

The continued advertisement of cigarettes in newspapers, in magazines, and on billboards in the United States has led to several proposals to extend restrictions to these media (USDHHS 1989). These proposals have included the following: a total ban on advertising and promotion of tobacco products; restrictions on the imagery, content, and format of tobacco advertisements; bans on certain types of promotion, such as targeting of children and sponsorship of sports and cultural events; and economic disincentives (for example, eliminating the tax deduction allowed, as a business expense, for advertising tobacco).

Table 2. Countries that control tobacco advertising and promotion, by type of restriction*

Country	Total ban	Mass media†	Sponsorship‡	Form and content§
North America				
Canada	X	X	X	W‖
United States		X		W
Latin America				
Argentina		X	X	X W
Bolivia		X	X	X W
Brazil		X	X	X W
Chile		X		W
Colombia		X		X W
Costa Rica		X		X
Cuba	X			
Ecuador		X		W
El Salvador		X		
Mexico		X		W
Panama		X		W
Paraguay		X		
Peru		X		W
Uruguay		X		W
Venezuela		X		W
Caribbean				
Bahamas				W
Bermuda				W
French overseas departments and territories¶	X			
Trinidad and Tobago		X		W

*For a summary of legislation in selected countries, see the notes in Appendix 1 to this chapter.
†Restrictions on use of television, radio, press, and billboards.
‡Restrictions on sponsorship of sports and cultural events.
§Restrictions on content, format, or location of advertising.
‖W = Health warning required.
¶For this table, the French overseas departments and territories are counted with the Caribbean countries.

Latin America

Fourteen Latin American countries have legislation restricting tobacco advertising and promotion. The most stringent statutes restrict advertising to statements about the quality, origin, and purity of tobacco; ban the representation of persons; or prohibit the association of smoking with pleasurable activities. Argentina, Bolivia, Brazil, Colombia, Mexico, and Paraguay have stringent laws. Bolivia requires the tombstone format, which allows no more than the name, brand, symbol, and representation of the tobacco product in a box. Argentina and Bolivia both prohibit advertising associated with sports.

A common type of Latin American law prohibits tobacco advertising that targets young people or that is displayed at times and places available to children and young people. Argentina, Brazil, Colombia, Ecuador, El Salvador, Mexico, and Peru have statutes of this type.

Virtually all Latin American countries that control tobacco advertising require a health warning on cigarette advertisements. Some statutes, such as those in Brazil, Colombia, Chile, and Uruguay, specify the frequency and duration of the health warning in the broadcast media. Brazil specifies the size, color, and prominence of the health warnings on advertisements on television, in the print media, on billboards, and on neon signs. Brazil also regulates the content of tobacco advertising by explicitly prohibiting claims of health, relaxation, stimulation, or sexual success. Scenes of children or adolescents are prohibited, and Argentina prohibits the use of minors in tobacco advertising.

In contrast, a few countries, such as Venezuela, have generic statutes that prohibit broadcast media from accepting advertising that directly or indirectly encourages consumption of cigarettes and tobacco products. Some countries—for example, Bolivia, Costa Rica, and Panama—have statutes that authorize the health authority to approve tobacco advertising and thereby restrict messages that are detrimental to health.

Caribbean

Only Trinidad and Tobago has adopted regulations that restrict the advertisement of cigarettes and tobacco products. Regulations of the Bureau of Standards prohibit the advertisement of cigarettes and tobacco products in cinemas or in films certified for viewing by general audiences or by audiences that include persons under 18 years of age. No advertising of tobacco products is allowed on television during children's programs, religious programs, educational programs, current affairs broadcasts, or parliamentary or formal government broadcasts. Televised cigarette advertisements may not exceed six minutes per hour, averaged over the day's programs, nor seven minutes in any single program period.

A health warning is also required in advertisements for cigarettes and other tobacco products in Trinidad and Tobago, the Bahamas, and Bermuda, although in Bermuda, the health warning need not be used on television and radio.

Jamaica has no legislation restricting tobacco advertising, but the Carreras Group Ltd., which has a monopoly on the Jamaican cigarette market, has voluntarily withdrawn advertising from television, radio, billboards, print media, and cinemas. The Carreras Group, however, sponsors sports and cultural events, notably annual awards for Sportsman and Sportswoman of the Year. The British Virgin Islands has no local television station but receives U.S. television programs; thus, the U.S. ban on advertising tobacco products on television applies to the U.S. and British Virgin Islands.

None of the Caribbean countries restrict the tobacco industry from sponsoring sports or cultural events. In fact, in Trinidad and Tobago, the West Indian Tobacco Company Ltd. recently received an award as Company of the Year, largely because of its extensive sponsorship of sports and cultural events. In Bermuda, 1987 legislation allows the use of a brand name when sponsoring an event or congratulating a person or group on an achievement. Furthermore, a health warning is not required during these activities because they are exempt from the definition of a tobacco advertisement.

Requirements for Health Warnings and Statement of Tar and Nicotine Yield

Mandatory warnings on packages and in advertisements of tobacco products are a form of health education; these warnings alert the public to the dangers of tobacco use. Most countries require warnings that state that smoking is harmful to health. Because such a warning is weak and may not get a smoker's attention, several countries have adopted several stronger warnings, which are used in rotation (Table 3).

Statements of tar and nicotine yield on packages of cigarettes constitute another form of health information. Canada, three Latin American countries, and two Caribbean countries have enacted legislation that mandates a statement on toxic substances in tobacco products.

Only a few countries have enacted legislation that sets a maximum level on harmful substances in tobacco products or tobacco smoke. Canada requires

detailed reporting from manufacturers and importers of tobacco products about toxic constituents. In Uruguay, the Commission for the Control of Smoking, under legislation enacted in 1988, is authorized to set maximum allowable levels of tar and nicotine for tobacco products.

North America

The Tobacco Products Control Act of Canada prohibits the sale of a tobacco product unless it displays one of the required health messages, lists the toxic constituents of the product and, when applicable, of the smoke produced from its combustion, and indicates the quantities of these constituents. As of 1990, manufacturers have been required to list on packages of cigarettes and fine-cut tobacco the yield of tar, nicotine, and carbon monoxide.

The regulations for the Act prescribe that one of the following messages appear on cigarette packages:

Smoking reduces life expectancy.

Smoking is the major cause of lung cancer.

Smoking is a major cause of heart disease.

Smoking during pregnancy can harm the baby.

Every package of cigars or pipe tobacco must display a list of toxic constituents and one of the following messages:

This product can cause cancer.

This product is not a safe alternative to cigarettes.

Every package of smokeless tobacco must display the following message:

This product can cause mouth cancer.

All these warnings must appear in English and French. A new warning will state that smoking is addictive. Other new warnings—for a total of eight possible warnings—will include messages about environmental tobacco smoke, lung disease, and stroke.

Canada is introducing an innovative way to distribute health warnings by requiring leaflets that must be removed from inside packages of cigarettes before the user can remove the cigarettes. The leaflets will contain messages more comprehensive than those of the health warning. The warnings on the exterior of cigarette packages will be enlarged so that they occupy 25 percent of the two major faces of the packages. Information on toxic constituents will also be required to be clearly displayed on the packages (Sweanor and Mahood 1990).

To obtain more precise information than that which is currently available about exposure to tobacco smoke, the Tobacco Products Control Regulations (Health and Welfare Canada 1989a) set forth detailed reporting requirements for cigarette manufacturers and importers. These requirements concern the constituents of the tobacco product, the quantity of each constituent (expressed as a proportion of the total weight of the product), and the quantity of each toxic constituent (milligrams per cigarette) in the smoke produced by the tobacco product. Moreover, the regulations prescribe the specific methods to be used in determining the quantities of such constituents.

Table 3. Countries that require health warnings or statement of tar and nicotine yield

Country	Standard warning*	Rotating or strong warnings	Statement of yield
North America			
Canada		X	X
United States		X	
Latin America			
Argentina	X		
Bolivia	X		
Brazil	X		
Chile		X	
Colombia	X		
Costa Rica		X	
Ecuador	X		X
El Salvador	X		
Mexico	X		X
Panama	X		
Paraguay	X		
Peru	X		
Uruguay	X		X
Venezuela	X		
Caribbean			
Bahamas		X	
Barbados	X		
Bermuda		X	X
French overseas departments and territories†		X	X
Trinidad and Tobago	X		X

*A single statement of warning not rotated with other statements.
†For this table, the French overseas departments and territories are counted with the Caribbean countries.